Remarks

Reconsideration is requested in view of the preceding amendments and the following remarks. Claims 1-9 and 25-30 are in the application. By this Amendment, new claims 34-48 are submitted for consideration. Upon entry of this Amendment, claims 1-9, 25-30, and 34-48 are in the application.

Applicant confirms the election of Species I, claims 1-9 and 25-30 in response to an Election/Restriction Requirement.

New claims 34-48 are submitted for consideration. Support for these new claims can be found at, for example, claims 1-9, claims 25-30, FIGS. 2-7, and page 8, lines 3-5. No new matter is introduced.

Claims 1-9, 25-26, and 28 stand rejected as allegedly anticipated by Asghari, PCT WO99/34539 ("Asghari"). This rejection is traversed. Claim 1, as amended, recites an optical transceiver that includes a diffractive optical element (DOE) configured to direct at least a portion of a free space optical signal to a first surface of an optical support. The first surface has a curvature configured to converge the portion of the free space optical signal to the second surface. Asghari does not teach or suggest such an optical transceiver. Instead, Asghari teaches optical chips (such as silicon-on-insulator chips) configured to receive light from a waveguide so that the light propagates in a light guiding layer. Page 7, last paragraph, and Figures 1-2. Asghari teaches directing light propagating in a guiding layer using gratings or mirrors etched in the guiding layer. In contrast, the optical transceiver of claim 1 is configured to receive and direct free space optical signals, not guided wave optical signals. Independent claim 8, as amended, recites an optical transceiver that includes a diffractive optical element and an optical support. The optical support includes a focusing surface and a coupling surface, wherein the focusing surface is configured to at least partially converge a free space optical beam received from the diffractive optical element to the coupling surface and at least partially collimate a free space optical beam received from the coupling surface and direct the partially collimated free space optical beam to the diffractive optical element. As noted above, Asghari teaches directing light confined in a propagating layer, and does not teach or suggest directing free space optical beams. For at least this reason, claims 1, 8, and respective dependent claims 2-7 and 9 are properly allowable over Asghari.

Asghari also fails to teach or suggest other claim features. For example, claim 5 recites a transceiver having a DOE configured so that a portion of a free space optical signal is directed by the DOE to the first surface so as to propagate at an angle that is greater than or equal to a critical angle with respect to the third surface. Asghari does not teach or suggest directing a portion of a free space optical signal received by a diffractive optical element at an angle greater than or equal to a critical angle. According to the Office action, "critical angle is interpreted as being any angle below which the optical signal is not properly diffracted to the optical output." Page 7. This is not the critical angle. According to Jenkins and White, Fundamentals of Optics, Mc-Graw Hill (1957), page 16 (copy attached), "the critical angle for the boundary separating two optical media is defined as the smallest angle of incidence, in the medium of greater refractive index, for which the light is totally reflected." Propagation with respect to such critical angles is described in the specification at, for example, page 8, lines 5-9. Asghari does not teach or suggest directing any portion of an optical beam at such an angle. In Asghari, light propagates within a light guiding layer, and there is no teaching or suggestion of a boundary between two optical media or a greater refractive index. While Asghari discloses a reflecting grating (12) etched in a silicon chip, this grating is situated within a single optical media (the light guiding layer) and is not associated with a boundary between optical media. For this reason, Asghari provides no teaching or suggestion of propagation at an angle greater than a critical angle, and claim 5 is properly allowable.

Claim 25 as amended recites a method of receiving a free space optical signal that comprises directing the free space optical signal to a diffractive optical element, and directing at least a portion of the free space optical signal received by the diffractive optical element to a surface of an optical support so that the portion propagates in the optical support at an angle greater than a critical angle with respect to the surface. Asghari does not teach or suggest such a method. In particular, Asghari does not teach or suggest any free space optical methods, and claim 25 and dependent claims 26-27 are properly allowable over Asghari for at least this reason. In addition, Asghari fails to teach or suggest directing a portion of a free space optical signal received by a diffractive optical element at an angle greater than a critical angle. As noted above, Asghari provides no teaching or suggestion of directing any portion of an optical beam with respect to a critical angle. Claims 25-27 are properly allowable over Asghari for at least this reason as well.

Claim 28 recites a method of transmitting a free space optical signal, comprising directing the free space optical signal to a curved surface of an optical support having optical power, and directing the free space optical signal from the curved surface to a surface of an optical support at an angle greater than a critical angle with respect to the surface. A diffractive optical element is provided at the surface of the optical support so that at least a portion of the free space optical signal is directed out of the optical support. Asghari is directed to light propagation in a guiding layer on a SOI substrate, and does not teach or suggest directing free space optical signals as claimed. Asghari also fails to teach or suggest directing an optical signal at an angle greater than a critical angle, and claim 28 and dependent claims 29-30 are properly allowable for at least these reasons.

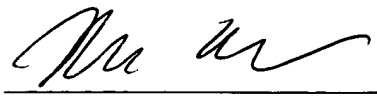
Claims 27 and 30 stand rejected as allegedly obvious in view of Asghari. As noted above, claims 27 and 30 depend from allowable claims 25 and 28, and are therefore allowable for at least this reason.

New claims 34-48 recite methods and apparatus that include prisms that are situated to direct optical beams. Asghari teaches propagation in a layer of a SOI substrate, and does not teach or suggest the features and combinations of features recited in new claims 34-48.

In view of the preceding amendments and remarks, all pending claims are in condition for allowance and action to such end is requested.

Respectfully submitted,

KLARQUIST SPARKMAN, LLP

By 

Michael D. Jones
Registration No. 41,879

One World Trade Center, Suite 1600
121 S.W. Salmon Street
Portland, Oregon 97204
Telephone: (503) 226-7391
Facsimile: (503) 228-9446